



**INS-F1**

**Digital Voltmeter**





**User guide**

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## 1 Safety guidelines

### 1.1 Definitions

- |  |  |
|--|--|
|  <b>DANGER</b>  | <i><b>DANGER</b> indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</i>                          |
|  <b>WARNING</b> | <i><b>WARNING</b> indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</i>                        |
|  <b>CAUTION</b> | <i><b>CAUTION</b> indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.</i>                       |
|  <b>NOTICE</b>  | <i><b>NOTICE</b> indicates a potentially harmful situation which, if not avoided, may result in damage of the product itself or of adjacent objects.</i> |

### 1.2 General instructions

- |  |   |
|--|---|
|  <b>DANGER</b>    | <p><i><b>Dangerous voltage</b></i><br/> <i>Electric shock currents could kill or seriously injure.</i><br/> <i>All electrical connections must be performed by a fully qualified electrician.</i><br/> <i>Ensure that the mains voltage matches the voltage marked on the nameplate!</i><br/> <i>Ensure that the device is provided with its own power supply line and electric fuse!</i><br/> <i>Even when the auxiliary power is switched off the unit terminals can carry dangerous voltage! Switch off the auxiliary voltage and the measured voltage when working on the device!</i></p> |
|  <b>WARNING</b> | <p><i><b>Improper use</b></i><br/> <i>Improper use of the device can cause personal injury, property or environmental damage.</i><br/> <i>Follow the maintenance instructions and use only original spare parts from the manufacturer!</i><br/> <i>The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use!</i></p>   |
|  <b>CAUTION</b> | <p><i><b>Improper installation</b></i><br/> <i>Improper installation can cause serious or minor injuries and damage the device.</i><br/> <i>Installation must be performed only by fully qualified personnel.</i></p>   |

## 2 Intended use

The INS-F1 is a digital voltmeter for measuring effective voltage from 5 to 400 V AC. The device requires 24 V DC auxiliary voltage. It is designed for use in industrial applications.

The device may only be operated

- properly installed and
- in accordance with the specifications.

### **Improper use**

- The device should not be used for medical devices which receive, control or otherwise affect human life or physical health.
- The device should not be used in an explosive environment.
- The device should not be used in an atmosphere with chemi-cally active substance.

### 3 Specifications

Table 3.1 Specifications

Power supply	24 (8...30) V DC
Input signal	5...400 V AC, (50±25%) Hz
Inputs	1
Power consumption, max.	4 W
Input resistance, min.	500 kohm
Accuracy	0.25% + 1 digit
Display	LED, 4 digits, 7 segment
Character height	14 mm
Display color	red
Sampling rate	1 reading / s
IP Code	front IP65, rear IP20
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	II
Ambient temperature	-20...+50 °C
Storage temperature	-25...+55 °C
Humidity	up 80% at 35°C (non-condensing)

### 4 Description

A 4-digit, 7-segment LED display (red) with 14 mm character height is located on the front of the device for displaying the measured values and error messages. The terminals are located on the rear side of the device. The maximum wire size is 0.75 mm<sup>2</sup>.

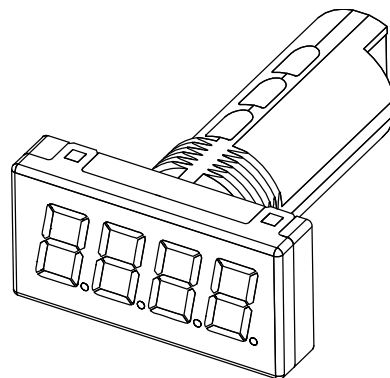


Fig. 4.1

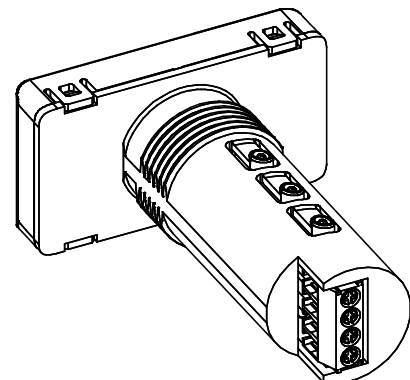


Fig. 4.2

### 5 Installation

The device is designed for switch panel mounting in a borehole of Ø22.5 mm (see Annex A for dimensional drawings).

Carefully position the supplied gasket on the display rear surface. Insert the cylindrical part of the device into the borehole and tighten the nut from the rear side of the switch panel.

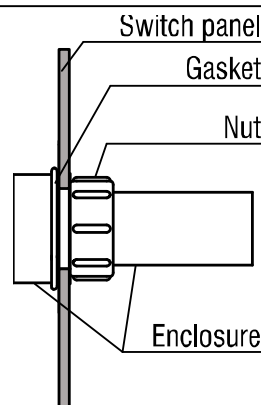


Fig. 5.1 Mounting

## 6 Electrical wiring



**DANGER**

### **Dangerous voltage**

**Even if the auxiliary voltage is switched off, dangerous voltage up to 400 V may exist!**

**Make sure that the device is fully disconnected from auxiliary power and measuring voltage before starting any commissioning or repair work.**

**Connect the power supply only after the wiring has been completed.**

- The voltmeter must be provided with its own fuse or a circuit breaker.
- 300 mA fuse or circuit breaker is recommended.
- Connect the leads of the supply and measuring voltage according to Fig. 3 to the device.
- The maximum wire size is 0.75 mm<sup>2</sup>.

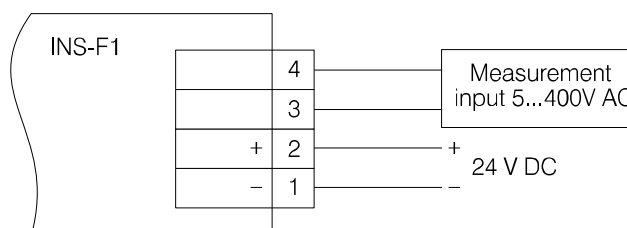


Fig. 6.1

## 7 Operation

After the power supply is switched on the following values will be displayed successively:

- Firmware checksum (8 digits, ticker-tape)
- Firmware version (Ux.xx)
- Measuring voltage

If the measuring voltage is less than 5 V the error message **0000** will be displayed.

If the measuring voltage is greater than 400 V the error message **HHHH** will be displayed.

If the measuring voltage is not displayed correctly, check the connecting cable and the polarity.

## 8 Maintenance

The maintenance includes:

- cleaning the housing and the terminals from dust, dirt and debris
- checking the fastening of the device
- checking the wiring (connecting leads, fastenings, mechanical damage)

The device should be cleaned with a damp cloth only. No abrasives or solvent-containing cleaners may be used.

The safety guidelines in Section 1 must be observed when performing maintenance.

## 9 Transportation and storage

Pack the device in such a way as to protect it reliably against impact for storage and transportation. The original packaging provides optimum protection.

If the device is not taken immediately after delivery into operation, it must be carefully stored at a protected location. The device should not be stored in an atmosphere with chemically active substances.

Permitted storage temperature: -25...+55 °C

### ► NOTICE

***The device may have been damaged during transportation.  
Check the device for transport damage and completeness!  
Report the transport damage immediately to the shipper and akYtec GmbH!***

## 10 Scope of delivery

–	INS-F1	1
–	Gasket	1
–	Mounting nut	1
–	User guide	1

## Appendix A. Dimensions

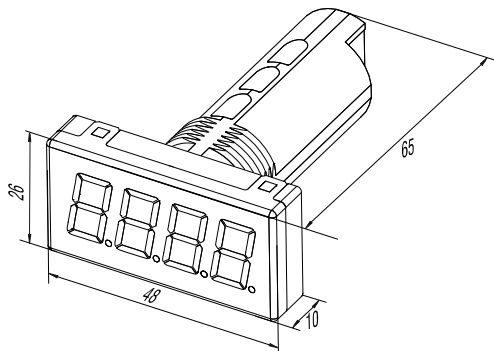


Fig. A1

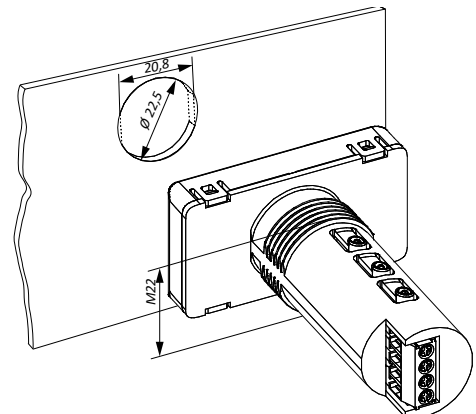


Fig. A2

To prevent the device spinning, the borehole in the front panel must correspond to the dimensions in Fig. A.2.